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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/631,623	08/04/2000	Yukihiro Nagai	50090-233	2307

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McDermott Will & Emery  
600 13th Street NW  
Washington, DC 20005-3096

EXAMINER

KANG, DONGHEE

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 12/19/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/631,623

Applicant(s)

NAGAI ET AL.

Examiner

Donghee Kang

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  - Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

2. Acknowledgment is made of receipt of applicant's Information Disclosure Statement (PTO-1449) filed October 1, 2001.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 & 4-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 1 & 4-5 recite the limitation of "*relatively thin to work as an electric fuse*" in line 9, "*relatively thin to be broken down...*" in line 2, and "*relatively thin to work as...*" in line 2, respectively. The term "relatively" is a relative term which renders the claim indefinite. The term "relatively" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

***Claim Rejections - 35 USC § 102***

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

6. Claims **3 & 5** are rejected under 35 U.S.C. 102(e) as being anticipated by Hause et al. (US 6,140,674).

Hause discloses a semiconductor device comprising (Fig.2):

a semiconductor substrate (20); at least a trench formed in the semiconductor substrate; a surface insulating film (80) formed along a surface of the trench of the semiconductor substrate; and a conductive film (170) formed on the surface insulating film, wherein the surface insulating film is formed relatively thin to work as a dielectric film for forming a capacitor.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim **4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hause et al. (US 6,140,674).

Regarding claim **4**, Hause does not explicitly teach the surface insulating film is formed relatively thin to be broken down for forming an electric fuse. It is known in the art a dielectric layer formed between two conductive layers is easily broken down when a high voltage, which is known as a "breakdown voltage", is applied to the conductive layer. Thus, Hause's device can be also used as a claimed fuse device by applying a high voltage to the conductive layer 170 to break an insulating film 80 down. It has been held that a recitation with respect to the manner in which a claimed device is intended to

be employed does not differentiate the claimed device from a Hause's device satisfying the claimed structural limitation.

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9. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hause et al. (US 6,140,674) in view of Perng et al. (US 6,090,661).

Hause disclose the semiconductor device further comprising a plurality of trenches formed adjacently, an insulating film is embedded in a selected one of the trenches (78) and a surface insulating film and a conductive film are formed in other trench.

Hause does not explicitly teach that pluralities of trench capacitor are formed. However, it is well known and also taught ay Perng et al to form pluralities of trench capacitor in the integrated circuit (Fig.1A). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to form pluralities of trench capacitor in order to provide a high density semiconductor memory device.

10. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen (US 5,682,049) in view of An et al. (US 6,165,849).

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Nguyen discloses a semiconductor device comprising (Fig.2):

at least an active region formed in the semiconductor substrate; a plurality surface insulating films (24 & 48) formed on a surface of the active region of the semiconductor substrate, wherein said surface insulating films being formed in a different thickness each other ( $t_1$  &  $t_2$ ); and a plurality of conductive films (20 & 33)

formed on each of the surface insulating films, wherein one of the surface insulating film (48) having smaller thickness is used as an electric fuse. See also Col.5, lines 10-65.

Nguyen does not explicitly teach a plurality of isolation regions for separating the active regions each other. It is well known in the art and also taught by An et al to form isolation region 32 in Fig.1G. Thus it would have been obvious in the art at the time the invention was made to combine the teaching of An with Nguyen's device in order to provide an electrical isolation between active regions.

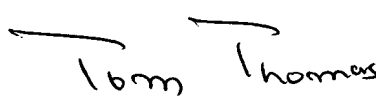
### **Conclusion**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 703-305-9147. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Donghee Kang, Ph.D.  
December 14, 2001

  
**TOM THOMAS**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**